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ABSTRACT

The Council on Ontario Universities Committee on Capital Financing presents this brief on the system's capital base and makes specific recommendations regarding formula funding that it sees as necessary for future planning; rental of space; renovations of existing facilities to safeguard the resources of the system; alterations required by the system to accommodate physical plant to changing enrollment patterns, changing curriculum, and changing approaches to patterns of learning and teaching; and new construction. An estimate of the cost of implementing the recommendations is included. (JMF)

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BRIEF TO THE
ONTARIO COUNCIL ON UNIVERSITY AFFAIRS

FOUNDATION FOR AN UNCERTAIN FUTURE:
THE CAPITAL BASE

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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Prepared by the
COU COMMITTEE ON CAPITAL FINANCING

Council of Ontario Universities
Conseil des Universités de l'Ontario

May, 1977

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Council of Ontario Universities
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130 St. George Street
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May, 1977

77-2

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COUNCIL OF ONTARIO UNIVERSITIES
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April 25, 1977

Dr. W.C. Winegard
Chairman
Ontario Council on University Affairs
801 Bay Street
2nd Floor
Toronto, Ontario

Dear Dr. Winegard:

I have been asked by Council to write expressing certain views in connection with the approval of the enclosed 1977 brief to OCUA on capital financing.

The brief places considerable stress on the development of a rational basis for determination of the needs of the university system for capital funding. For several years, successive briefs have presented careful analysis documenting system requirements. Nonetheless, each year funding has been made available at only a small fraction of the recommended level. Given the frustration engendered by this experience, we respectfully request that OCUA develop a methodology for assessing the capital needs of the university system, or at a minimum, respond to our analysis with a critique.

It must be emphasized that since the imposition of a freeze on capital funding in 1972, a substantial backlog of unmet requirements has built up, and that some of these, involving the maintenance of the existing fabric, are cumulative. As the Committee notes in its conclusion, the amount of funding requested for 1978-79 is substantially greater than that made available for several years. If such an increase for 1978-79 is not seen by OCUA as feasible, we ask that a reasonable figure be established as a target to be achieved as rapidly as possible in succeeding years. For, as you will agree, the longer that capital requirements are unmet, the greater will be the backlog which must eventually be overcome.

At the risk of undermining our arguments on the seriousness with which capital needs should be viewed, we must also respond to questions the Minister has posed on the "trade-off" between operating and capital funding.

First, we wish to state our conviction that there are real needs in each category and that the different categories should not be traded off against

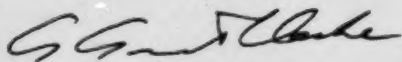
Dr. W.C. Winegard
April 25, 1977
Page 2

one another. Also, in this instance, we doubt that the trade-off is as great as may be apparent. The long term significance of capital spending means that it is reasonable to amortize the costs over an extended period. Employment of the debenture funding approach can lessen the immediate impact on the government's granting level of capital financing of the order we request.

To the extent, however, that a trade-off is seen by government as necessary, we wish to record the priorities of our Council. For 1978-79, priority should be given to operating grants, up to the level requested in the operating grants brief.

The careful consideration by OCUA of our representations will be much appreciated.

Sincerely,



for Edward J. Monahan
Executive Director

EJM:jf

FOREWORD

The following brief on capital support is not a substantial document in terms of the number of pages of text. This is so because in many respects it repeats arguments that were more fully developed in previous briefs. The reader is referred, in particular, to:

- 1) Capital Financing: Funding by Formula and Cyclic Renewal, October, 1974;
- 2) Cyclic Renewal and the Special Problem of Equipment, August, 1975;
- 3) Capital Support: Objectives, Policy, Implementation, April, 1976;
- 4) A Proposal for the Provision and Distribution of Capital Funds, December, 1976.

The Committee on Capital Financing welcomes the recent initiative of OCUA in the area of capital assistance, as presented in Advisory Memorandum 76-VIII. Since the introduction of the "capital freeze" in 1972, the absence of a defined government policy for determination of the level of capital financing and for distribution of these funds has seriously frustrated universities in their attempts to plan the more effective utilization and renewal of physical plant. These facilities are presently valued at more than \$1.5 billion. The Committee regards the appearance of Advisory Memorandum 76-VIII as a necessary first step in filling what OCUA has termed a policy vacuum in the area of capital assistance.

FORMULA FUNDING

The benefits of formula funding, both to government and universities, have been clearly enunciated in the Ontario Operating Formula Manual published by MCU. In addition to "buttressing the independence of universities", providing "equitable treatment" and "obviating the necessity for detailed scrutiny of university ... submissions", a formula approach

provides a more certain basis for university planning and gives universities maximum incentive for effective management.

The Committee on Capital Financing is disappointed that

these principles, which regulate the distribution of operating funds, should not apply to the capital funds available to the university system. The Committee therefore welcomes the statement by OCUA that the question of formula distribution of funds for building renovation, alteration and replacement will be kept under active review. We trust that this active review will soon manifest itself and that it will entail a significant measure of consultation with the university community. Certainly, the Committee on Capital Financing remains willing to continue to explore the complexities of this matter.

Formula funding, as is indicated by the elaboration of an operating funding methodology by OCUA, can be viewed as encompassing more than just a mechanism for distributing capital support. The Committee on Capital Financing views the development of a means for determining the overall level of capital assistance as being as important, if not more so, than a mechanism for allocating such assistance. In this respect, Advisory Memorandum 76-VIII falls considerably short of meeting the basic requirements of the system. Indeed, the absence of system funding advice in the capital area in Advisory Memorandum 76-VIII will give rise to serious problems internal to OCUA's advice on guidelines. For example, in saying that "building replacement projects should be permitted to compete on equal terms with renovation and alteration projects...." OCUA should recognize

that at today's construction prices and within an extremely constrained overall level of support for capital projects, replacement construction could consume such a high proportion of funds available that little or no renovation or alteration work could be carried out. The Committee on Capital Financing therefore recommends:

Recommendation 1

That OCUA, in consultation with the university community, develop a system funding methodology for provision of capital assistance for 1978-79.

Whether or not a formula approach is used in the distribution of capital assistance, the Committee on Capital Financing makes two recommendations which it feels would alleviate some of the serious logistical problems which the present methodology gives rise to.

Recommendation 2

That the deadline for university submission of project requests for 1978-79 be December 1, 1977 and that project approvals be issued by the Ministry no later than February 1, 1978.

Recommendation 3

That universities be permitted to expend funds approved for any given year over a two year period.

In order to further discussion, the Committee on Capital Financing suggests that system funding should comprise four components:

- 1) rentals,
- 2) renovations,
- 3) alterations,
- 4) new construction.

RENTALS

One of the ways in which universities have been forced to adapt to the capital freeze is by rental of space. Table 1 indicates that, in 1975-76, the Ontario university system was renting 392,077 NASF at a cost of \$1,289,265; in 1976-77 these figures were 416,239 and \$1,430,535 respectively. The decision to rent space arises either when an institution is short of space overall or when it has a requirement for a particular kind of space which could otherwise only be provided through extensive alteration of existing space. The Committee believes that provision for support of rented space should be made within a programme of capital assistance for universities in a space deficit position according to COU standards. The problems of universities whose space exceeds that which would be provided by COU standards, but who are nonetheless obliged to rent space, should be dealt with through the provision of alterations money.

The Committee on Capital Financing therefore recommends:

Recommendation 4

That in the case of universities operating in a space deficit position, as defined by COU standards, provision for support for the cost of space rental should be made. Such provision would be required until funds for new construction can correct these deficits in a more permanent way.

RENOVATIONS

As trustees of a physical plant valued in excess of \$1.5 billion, the universities of the province have no alternative but again to urge that funds available for renovation be increased. No sound investor could do other than to try to protect an investment of this magnitude.

All of the work undertaken by COU in past years in this area would suggest that, as a minimum, an expenditure of 1% of the value of existing physical plant is required to safeguard the resources of the system.¹ Not once has the figure established by COU been seriously challenged; but not once, in recent years, have the requisite funds been provided.

¹Building Blocks, Volume 5, p. 2.23.

Notwithstanding its past work in this area, the Committee on Capital Financing intends to ask the directors of physical plant to undertake a study which would be completed within a year. The study would establish definitions to separate major repairs (capital) from annual maintenance (operating) and analyse the nature and frequency of major repairs to the various components of a building so that the annual cost could be expressed as a percentage of the initial cost of construction. We are convinced that this area of expense lends itself to this form of evaluation and that it is entirely reasonable to distribute funds for this purpose on a formula basis.

Despite its intention to do further work in this area, the Committee on Capital Financing, nevertheless, recommends:

Recommendation 5

That 1% of the present value of the existing physical plant² of the system be set aside to provide for renovations.

The Committee is further concerned with the additional rigidity being imposed on eligibility of projects for capital support as

²The Committee is unable, at present, to estimate the value of site work and utilities but recognizes that funds for these purposes will have to be provided out of the allowance for renovations.

set forth in Advisory Memorandum 76-VIII. As noted above, we are aware of the desirability of properly distinguishing between repair and maintenance work which should be supported by operating funds and that which should be supported by capital funds.

The Committee would prefer a set of definitions which make such a distinction clear but in the absence of such, we reluctantly accept the \$25,000 minimum value as the only workable alternative, at present.

It is clear, nonetheless, that with this approach certain types of renovation work qualify for support while others do not, merely because of the scale of the work involved. For example, it seems illogical to deny support to a \$20,000 roofing project on a small building, while awarding \$100,000 for a similar project on a large building.

The Committee on Capital Financing therefore recommends:

Recommendation 6

That universities, to attain the \$25,000 minimum value, be permitted to combine projects among several buildings where the work proposed is of such a nature that it would qualify for support if being conducted on a larger scale.

Finally, the Committee notes that were this additional flexibility not to be provided, further pressure would be placed on already constrained university operating budgets. The Committee is aware that the COU Committee on Operating Grants has not made provision for the operating budget implications of Advisory Memorandum 76-VIII, in its 1978-79 operating grants brief to OCUA.

ALTERATIONS

Unlike the past when funds were available for new construction, adequate funds for alterations are more than ever required by the system today in order to accommodate physical plant to changing enrolment patterns, changing curriculum, and changing approaches to patterns of learning and teaching. In addition, alteration funds can effectively be used to alleviate the problems of a space imbalance within a given institution. In its past work in this area, COU established that spending requirements for alterations could reasonably be estimated at 0.5% of the present value of physical plant.³ Again, the Committee has seen no evidence to suggest that this value is incorrect. We

³Building Blocks, Volume 5, p. 2.23

would therefore recommend:

Recommendation 7

That 0.5% of the present value of the existing physical plant of the system be set aside to provide for alterations.

NEW CONSTRUCTION⁴

The Committee on Capital Financing accepts the comments of OCUA with respect to additional construction. It urges the adoption of COU standards as the point of reference against which decisions on additional construction should be made. In doing so, it is conscious of the fact that COU standards generate a slightly different entitlement than does the weighted enrolment approach used within the Interim Capital Formula.⁵ Nonetheless, insofar as no suggestion is made to systematically build up to entitlement and insofar as Interim Capital Formula entitlements do not distinguish among

⁴In the present brief, "new" construction encompasses both "additional" and "replacement" construction. OCUA's Advisory Memorandum 76-VIII equates new construction with what we would term additional construction.

⁵The Committee makes such a statement cautiously insofar as the two approaches to calculating entitlement are not strictly comparable. Given that the Interim Capital Formula makes no provision for space in Education and the Health Sciences, an estimate of the relative "generosity" of the two methodologies is based on a comparison of the entitlements of institutions with little or no space in these disciplines. Under these conditions, COU standards seem to generate about 3% more space than does the Interim Capital Formula. The Committee believes that much of this difference is attributable to the provision of space for part-time FTEs under the ICF at a rate of $\frac{1}{2}$ the amount for full-time FTEs.

types of space, it seems more appropriate to use a set of standards, which have been agreed to by all universities, to make judgements on requests for the provision of funds for additional construction. We therefore recommend:

Recommendation 8

That decisions to fund additional construction, under OCUA guidelines, be based on measurement of space requirements using COU standards as outlined in the appendix.

In recommending the abandonment of the methodology for calculating entitlement devised for the Interim Capital Formula, the Committee is conscious of the fact that COU's revised space standards make no allowance for age/quality. Under the Interim Capital Formula, this allowance took the form of a discount to the inventory proportional to the age of buildings, and resulted in an increase in entitlement for new space and/or the provision of sufficient funds to upgrade old buildings to current standards. Although the application of the discount was frozen at the same time as the moratorium on the construction of new facilities, the discount as calculated by MCU amounted to the equivalent of 2,264,000 square feet of new space (1,582,000 square feet for age/quality + 682,000 square feet for demolitions). Obviously age/quality is a factor -- but just how much allowance should be made for it is a difficult question to answer in a generalized

way. Some fifty year old buildings may still be serving their purposes admirably while other buildings less old have had to be remodelled to serve changing needs. This is an area where each institution can judge its own priorities in annual submissions to MCU and the space guidelines can be used to judge the relative merits of all requests.

Data recently gathered by COU at the request of OCUA provides an age profile of the present space inventory and the distribution by age, shown in Table 4. While welcoming OCUA's recognition of the permissibility of replacement construction, we note that if OCUA is serious in its recommendation that "building replacement projects compete on equal terms with renovation and alteration projects....", the Committee on Capital Financing can see no alternative but to recommend that a significant sum of money be set aside for new construction. The Committee has no well defined methodology for arriving at the appropriate sum. We can only note that the Interim Capital Formula would have generated at today's construction prices⁶ a total requirement of (2,264,000 square feet x \$83.16) \$188 million. The Committee therefore recommends:

⁶ See A Proposal for the Provision and Distribution of Capital Funds, COU, December 6, 1976, p. 4.

Recommendation 9

That an amount equivalent to one-half of the total monies provided for renovations and alterations be set aside annually to fund new construction, providing Recommendations 5 and 7 prove to be acceptable.

CONCLUSION

Using the inventory data reported in Table 2 attached, one can estimate that the cost of implementing the recommendations contained in this brief as follows:

a) Total inventory (excluding rentals)	21,257,597 NASF
b) Cost per square foot	\$83.16
c) Present value of the system	\$1.768 billion
d) Provision for:	
i) Renovation at 1% system value	\$17.7 million
ii) Alteration at 1/2% system value	8.8
iii) New construction at 50% of i) + ii) above	13.3
iv) Estimate for rental allowance	<u>2.0</u>
	\$41.8 million

It is quite clear that the funds required to implement these recommendations would give rise to a significant increase over present levels of financing. That they do so in total cannot deter the Committee from making any one of the recommendations

individually. Undoubtedly universities will resist a massive shift of funds to capital assistance at the expense of already constrained operating support. The only alternative, if Government wishes to preserve the integrity of Ontario's investment in the physical resources of the university system, is to gear up for the major infusion of new money that will be required to raise capital support to an appropriate level.

:tk

April 27, 1977.

Table 1
INVENTORY OF RENTED SPACE,
1975-76 AND 1976-77

	1975-76 NASF	1976-77 NASF	1975-76 \$	1976-77 \$
Brock	-	-	-	-
Carleton	-	-	-	-
Guelph	-	-	-	-
Lakehead	1,800	1,800	840	840
Laurentian	-	-	-	-
McMaster	10,657	10,657	35,232	35,232
Ottawa	139,840	139,840	398,856	456,061
Queen's	16,198	16,948	36,826	53,000
Toronto	106,502	101,306	469,931	468,992
Erindale	-	-	-	-
Scarborough	534	534	4,272	4,272
Trent	-	-	-	-
Waterloo	18,966	47,864	32,106	95,433
Western	-	-	-	-
Wilfrid Laurier	25,464	26,788	94,546	101,120
Windsor	1,785	1,785	2,528	2,528
York	-	-	-	-
Glendon	-	-	-	-
Ryerson	70,331	68,717	214,128	213,047
TOTAL	392,077	416,239	1,289,265	1,430,525

Table 2
INVENTORY OF UNIVERSITY SPACE, 1975-76

	NASF 1-15	HEALTH AND EDUCATION	SCHEDULED DEMOL.	PRIVATELY FUNDED	RENTAL
Brock	468,119	-	-	5,344	-
Carleton	1,066,712	-	-	-	-
Guelph	1,504,416	201,949	126,405	45,823	-
Lakehead	466,854	31,800	-	-	1,800
Laurentian	456,732	-	-	-	-
McMaster	1,951,324	711,212	6,564	-	20,657
Ottawa	1,511,595	174,971	160,838	46,594	139,840
Queen's	1,704,483	225,693	-	267,537	16,948
Toronto	3,939,682	787,747	338,853	293,187	106,502
Erindale	408,665	-	7,122	21,393	-
Scarborough	331,270	-	28,915	4,354	534
Trent	307,892	-	-	-	-
Waterloo	1,529,081	39,707	-	41,043	18,966
Western	2,161,832	300,586	-	607,406	-
Wilfrid Laurier	313,760	-	13,620	53,346	25,464
Windsor	936,453	49,275	-	-	1,785
York	1,499,553	-	-	-	-
Glendon	148,946	-	-	-	-
Ryerson	943,055	27,142	-	-	70,331
TOTAL	21,650,424	2,550,082	682,317	1,386,027	392,827

Notes:

- Column 1: Assignable square footage in COU space categories 1-15; otherwise known as net assignable square footage (NASF).
Column 2: Space included in column 1 assigned to activity in Education & Health Sciences.
Column 3: Space included in column 1 which would be demolished if funds for replacement were immediately available.
Column 4: Space in column 1 which has been privately funded since November, 1971, or space of earlier construction which was not included in the allocation inventory used for the Interim Capital Formula.
Column 5: Space in column 1 which is presently being rented.

Table 3 CALCULATION OF ENTITLEMENT BASED ON 1975-76 INPUT MEASURES		
	1975-76 ICF Entitlement	1975-76 COU Entitlement
Brock	361,090	396,150
Carleton	1,111,359	1,286,776
Guelph	1,251,607	1,546,399 ¹
Lakehead	389,678	491,190 ¹
Laurentian	365,760	385,997
McMaster ²	1,195,838	1,259,096
Ottawa	1,163,254	1,743,133 ¹
Queen's	1,125,178	1,647,597 ¹
Toronto	2,433,204	3,848,330 ¹
Erindale	399,478	380,429
Scarborough	398,436	376,186
Trent	342,096	311,088
Waterloo	1,583,686	1,578,435 ¹
Western	1,776,629	2,196,891 ¹
Wilfrid Laurier	398,760	365,727
Windsor	791,834	993,809 ¹
York	1,439,388	1,630,279
Glendon	126,511	138,076
Ryerson	1,162,992	1,118,763 ¹
TOTAL	17,816,778	21,694,351
1. COU entitlement includes provision for Health Science and and Education space. 2. COU entitlement for McMaster excludes Health Science space.		

Table 4

AGE PROFILE OF ONTARIO UNIVERSITY SPACE,¹ 1975-76

	NASF 0-9 Years	NASF 10-19 Years	NASF 20-29 Years	NASF 30-39 Years	NASF 40-49 Years	NASF 50+ Years	NASF Total	Average Age
Brock	411,556	54,900	-	1,663	-	-	468,119	5.33
Carleton	695,789	370,923	-	-	-	-	1,066,712	8.12
Guelph	887,206	351,430	61,099	2,656	45,802	156,223	1,504,416	15.25
Lakehead	345,356	119,698	-	-	-	-	465,054	8.16
Laurentian	291,825	164,907	-	-	-	-	456,732	6.97
McMaster	1,472,978	377,601	67,542	16,443	6,193	-	1,940,757	7.08
Ottawa	684,708	243,425	88,696	-	-	354,926	1,371,755	21.18
Queen's	742,111	716,475	94,390	8,937	69,169	73,401	1,704,483	13.56
Toronto	1,383,428	1,008,063	393,269	-	251,169	797,251	3,833,180	25.27
Erindale	401,543	-	6,701	175	-	246	408,665	3.09
Scarborough	304,055	-	11,063	-	-	16,152	331,270	9.91
Trent	260,399	26,828	-	1,547	-	19,118	307,892	12.15
Waterloo	930,125	578,122	-	-	-	1,868	1,510,115	8.72
Western	1,491,586	444,015	103,688	12,697	25,751	84,095	2,161,832	10.27
	153,977	99,906	20,793	13,620	-	-	288,296	9.15
Windsor	472,065	383,431	-	-	25,748	-	934,668	11.55
York	1,307,246	192,307	-	-	-	-	1,499,553	6.45
Glendon	-	135,158	-	-	-	13,788	148,946	16.19
Ryerson	553,406	319,249	-	-	-	-	872,655	8.31
TOTAL	12,789,359	5,586,438	882,695	57,738	423,832	1,535,038	21,275,100	

1. Excluding rentals

1.	Classrooms	13.0 s.f./F.T.E. student
2.	Classlabs - Group W*	8.5 s.f./weekly lab contact hour
	" X	6.5 s.f./ " " " "
	" Y	5.0 s.f./ " " " "
	" Z	3.0 s.f./ " " " "
3.	Research - Group A*	500 s.f./Researcher (i.e. FTE Faculty + ½ Grads.)
	" B	350 s.f./ "
	" C	200 s.f./ "
	" D	75 s.f./ "
	" E	0 s.f./ "
4.	Academic Office	210 s.f./F.T.E. Faculty 40 s.f./F.T.E. Grads
5.	Library - Stack	0.08 s.f./Equiv. Vol. for 0-300,000 Vols. 0.07 s.f./ " " " 300,000-600,000 0.06 s.f./ " " " all other Vols.
	- Study	5.0 s.f./F.T.E. Undergraduate 12.0 s.f./ " " (in Profess ional Programs)* 8.0 s.f./ " Graduate
	- Service	0.25 x (Stack + Study)
6.	Athletics	20,000 s.f. + 8.0 s.f./F.T.E. student
7.	General Use (Food Services, Book-store, Commons, Assembly and Exhib.)	17.5 s.f./F.T.E. student
8.	Special Use (A/V, Health Service, Maint., Computer, Stores.)	6.0 s.f./F.T.E. student
9.	Administrative Office	9.0 s.f./F.T.E. student

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Program Classification Scheme

The proposed space formula makes use of program or discipline groupings in the generation of Class Labs, Research and Library space. The program groups were developed originally from those listed in Appendix D of Volume 1 of Building Blocks. The programs have been classified at the "second level" of detail as listed in that publication and it may be taken that these second levels are inclusive of the detailed program names listed at the "third level".

The list of professional programs used in the generation of library facilities are those of the Operating Grants formula.

Program Related Space Factors

<u>Program/Discipline</u>	<u>Class Factor</u>	<u>Lab Group</u>	<u>Research Factor</u>	<u>Group</u>	<u>Professional Program</u>
<u>Education</u>					
Physical and Health Education and Recreation	3.0	Z	75	D	
Other Education	5.0	Y	0	E	YES (except 4 year concurrence)
<u>Fine & Applied Arts</u>					
Theory, Ceramics, Drama, Theatre, Engraving, Industrial Design, Interior Design, Lithography, Music, Painting, Art, Printing, Sculpture	6.5	X	0	E	
<u>Humanities & Related</u>					
Classics, Classical and Dead Languages, Creative Writing, History, Mass Media Studies, Modern and Mediaeval Languages and Literature, Philosophy, Religious Studies, Translation and Interpretation	3.0	Z	0	E	
Library and Records Science	3.0	Z	75	D	YES
<u>Social Sciences & Related</u>					
Anthropology, Archaeology, Geography, Man/Environment Studies	5.0	Y	75	D	
Area Studies, Commerce, Business Administration, Economics, Political Science, Sociology, Military Studies, Linguistics	3.0	Z	0	E	
Law, Social Work	3.0	Z	0	E	YES
Psychology	5.0	Y	200	C	
<u>Agriculture & Biological Science</u>					
Agriculture	8.5	W	500	A	
Biochemistry, Biology, Biophysics Botany, Zoology	5.0	Y	500	A	

<u>Program/Discipline</u>	<u>Class</u> <u>Factor</u>	<u>Lab</u> <u>Group</u>	<u>Research</u> <u>Factor</u>	<u>Group</u>	<u>Professional</u> <u>Program</u>
<u>Agriculture & Biological Science (cont'd)</u>					
Household Science & Related	5.0	Y	75	D	
Veterinary Medicine and Sciences	8.5	W	500	A	YES
<u>Engineering & Applied Sciences</u>					
Architecture, Landscape Architecture	6.5	X	0	E	
Engineering, Engineering Science	8.5	W	350	B	
Forestry	8.5	W	350	B	
<u>Health Professions and Occupations</u>					
Medicine	6.5	X	500	A	YES
Dentistry, Optometry	6.5	X	350	B	YES
Dental Hygiene, Medical Technology, Pharmacy, Public Health	6.5	X	350	B	
Nursing	3.0	Z	0	E	
Rehabilitation Medicine					
Art as Applied to Medicine	6.5	X	0	E	
Clinical Science Depts.*	0	-	0	E	
<u>Mathematics and Physical Sciences</u>					
Actuarial Science, Applied Mathematics (except Computer Science), Mathematical Statistics, Mathematics	3.0	Z	0	E	
Computer Science	3.0	Z	0	E	
Chemistry, Geology and related, Metallurgy, Material Science, Meteorology, Oceanography, Physics.	6.5	X	500	A	

*Do not report corresponding inventory